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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/720,329 02/27/01 ROMAN

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002292 MMC2/0706
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EXAMINER

V.L.D.
ART UNIT

PAPER NUMBER

2818
DATE MAILED:

07/06/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.

09/720,329

Applicant(s)

ROMAN ET AL.

Examiner

DAVID VU

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 February 2001.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are objected to by the Examiner.
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

- 15) ☒ Notice of References Cited (PTO-892)
- 16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 17) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5.
- 18) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 19) ☐ Notice of Informal Patent Application (PTO-152)
- 20) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claims 1-17 are rejected under 35 U.S.C. 102(b) as being anticipated by Cao (US 5,965,281).

Regarding claim 1, Cao, in related text (Col.6, Lines. 7-47) and figure (Figure.15) discloses a method in the fabrication of an organic thin-film semiconducting device, wherein the semiconducting device comprises an electrode arrangement with electrodes contacting a semiconducting organic material, and wherein the method is characterized by depositing a first layer of a conducting 14 in the form of a patterned or non-patterned layer on an insulating substrate 12, such that at least a portion of the substrate 12 is covered by the first layer 14 modifying the work function of the conducting of the first layer 14 by depositing a second layer 16 of a conducting polymer with a work function higher than that of the material in the first layer such that the layer of the conducting polymer mainly covers the first layer, whereby the combination of the first layer and the second layer constitutes the anode of the electrode arrangement and the work function of the anode becomes substantially equal to that of the conducting polymer, depositing a third layer 24 of a semiconducting organic material on the top

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of the anode, and optionally and in case only a portion of the substrate 12 is covered by the anode, also above at least some of the portion of the substrate 12 not covered by the anode, and depositing a patterned or non-patterned fourth layer 18 of a metal on the top of the third layer 16, whereby the fourth layer constitutes the cathode of the electrode arrangement .

Regarding claim 2, characterized by the conducting material of the first layer being a metal. (Col. 10, Lines. 15-37)

Regarding claim 3, characterized by selecting the metal among calcium, manganese, aluminium, nickel, copper or silver. (Col. 10, Lines. 15-37)

Regarding claim 4, characterized by selecting the semiconducting material of the first layer among silicon, germanium or gallium arsenide. (Col. 10, Lines. 15-37)

Regarding claim 5, characterized by depositing the second layer as a dispersion from a dispergent or as a dissolved material from a solution. (Col. 10, Lines. 1-13)

Regarding claim 6, characterized by depositing the second layer in a melt application process. (Col. 10, Lines. 1-13)

Regarding claim 7, characterized by selecting the conducting polymer in the second layer on a doped conjugated polymer. (Col. 6, Line. 54-Col. 7, Lines. 35)

Regarding claim 8, characterized by selecting the conjugated polymer or a copolymer which contains segments of π -conjugated moieties. (Col. 6, Line. 54-Col. 7, Lines. 35)

Regarding claim 9, characterized by selecting the dopant for the conjugated polymer as poly(4-styrene sulphonate) (PSS). (Col. 15, Lines. 35-60)

Regarding claim 11, characterized by selecting the semiconducting organic material in the third layer . (Col. 7, Lines 37+)

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Regarding claim 12, characterized by selecting the conjugated polymer in the third layer among poly(2-methoxy, 5-(2'-ethylhexyloxi)-1,4-phenylene vinylene) (MEH-PPV) . (Col. 14, Lines 20+)

Regarding claim 13, characterized by selecting the metal of the fourth layer among metals which have a lower work function than that of the anode. (Col. 10, Lines. 15-50)

Regarding claim 14, characterized by selecting the metal of the fourth layer as the same as the metal selected for the first layer (Col. 10, Lines. 15-50)

Regarding claim 15, characterized by selecting aluminium as the metal of the fourth layer. (Col. 10, Lines. 15-50).

Regarding claims 16-17, apparatus claims 16-17 are rejected as obvious in view of the method taught by Cao.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cao (US 5,965,281) in view of Staring et al. (US 6,014,119)

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Cao discloses all claimed subject matter, but fails to expressly mention the doped conjugated polymers as poly (3,4-ethylenedioxythiophene) (PEDOT). Cao, in related text (Col. 15, Lines. 35-60) discloses the doped conjugated polymer as polyaniline (PANI) and polythiophene (PEDT) doped with poly(4-styrene sulphonate) (PSS). However, Straring et al., in related text (Col. 6, Lines. 53-56), disclose suitable polymers for use in the transparent electrode layers are polyaniline (PANI) and poly-3,4-ethylene dioxythiophene (PEDOT). It would have been obvious to one with ordinary skill in the art at the time of the invention was made to use PANI /PEDT or PEDOT as the doped conjugated polymer because these polymers can be given both the electrically conducting state and the insulating state.

Conclusion

3. Any inquiry concerning this communication or earlier communications from the examiner should be directed to David Vu whose telephone number is (703) 305-0391. The examiner can normally be reached on Monday-Friday from 8:00am to 5:00pm.

If attempt to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Nelms., can be reached on (703) 308-4910.

David Vu
DV
Art Unit 2818


David Nelms
Supervisory Patent Examiner
Technology Center 2800